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IS 5861 (1993): Jams, Jellies and Marmalades [FAD 10: Processed Fruits and Vegetable Products]

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जैम, जैली और मार्मलेड — विशिष्टि

(पहला पुनरीक्षण)

Indian Standard

JAMS, JELLIES AND MARMALADES — SPECIFICATION

(First Revision)

UDC 664·856 : 664·858

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

May 1993

Price Group 3

(First Revision)

(Foreword) — Insert the following before the last para:

'A scheme for labelling environment friendly products known as ECO-Mark has been introduced at the instance of the Ministry of Environment and Forests (MEF), Government of India. The ECO-Mark shall be administered by the Bureau of Indian Standards (BIS) under the *BIS Act*, 1986 as per the Resolution No. 71 dated 20 February 1991 and Resolution No. 425 dated 28 October 1992 published in the Gazette of the Government of India. For a product to be eligible for marking with the ECO-Mark it shall also carry the Standard Mark of BIS for quality besides meeting additional environment friendly (EF) requirements. The environment friendly requirements for jams, jellies and marmalades are, therefore, included through Amendment No. 2 to this standard.

This amendment is based on the Gazette Notification No. 624 (E) dated 6 September 1995 for Labelling Beverages, Infant Foods, Processed Fruits and Vegetable Products as environment friendly, published in the Gazette of the Government of India.'

(Page 2, clause 4.2.8) — Insert the following new matter after 4.2.8:

'**4.3 Additional Requirements for ECO-Mark**

4.3.1 *General Requirements*

4.3.1.1 The product shall conform to the requirements prescribed under 4.1 to 4.2.8.

4.3.1.2 The manufacturer shall produce the consent clearance as per the provisions of *Water (PCP) Act*, 1974, *Water (PCP) Cess Act*, 1977 and *Air (PCP) Act*, 1981 along with the authorization if required under *Environment (Protection) Act*, 1986 and the Rules made thereunder to the Bureau of Indian Standards while applying for the ECO-Mark and the product shall also be in accordance with the *Prevention of Food Adulteration Act*, 1954 and the Rules made thereunder. Additionally, FPO 1955 (Fruit Product Order) framed under *Essential Commodities Act*, 1955, *Standards of Weights and Measures Act*, 1977 requirements wherever applicable has to be complied with.

4.3.1.3 The product/packaging may also display in brief the criteria based on which the product has been labelled environment friendly.

4.3.1.4 The material used for product/packing shall be recyclable or biodegradable.

4.3.1.5 The date of manufacture and date of expiry shall be declared on the product/package by the manufacturer.

4.3.1.6 The product shall be microbiologically safe when tested as per IS 5403 : 1969 and IS 5887 (Part 5) : 1976 and shall be free from bacterial and fungal toxins.

4.3.1.7 The pesticide residues, if any in the product shall not exceed the limit as prescribed in *PFA Act*, 1954 and the Rules made thereunder.

4.3.1.8 The product/package or leaflet accompanying it may display instructions of proper use, storage and transport (including refrigeration temperature compliance) so as to maximize the product performance, safety and minimize wastage.

4.3.2 *Specific Requirements*

4.3.2.1 The product shall not contain any of the heavy metal contaminants in excess of the quantities prescribed in Table 1.'

(*Page* 3, *clause* 5.2) — Insert the following new clause after 5.2:

'5.3 ECO-Mark

The product may also be marked with the ECO-Mark, the details of which may be obtained from the Bureau of Indian Standards.'

(*Page* 3, *Annex* A) — Insert the following new references:

'*IS No.*	*Title*
5403 : 1969	Methods for yeast and mould count of foodstuffs
5887 (Part 5) : 1976	Methods for detection of bacteria responsible for food poisoning : Part 5 Isolation, identification and enumeration of *Viberio Cholerae* and *Vibrio Parahaemolyticus* (*first revision*)'

(FAD 10)

Reprography Unit, BIS, New Delhi, India

Processed Fruits and Vegetable Products Sectional Committee, FAD 10

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Processed Fruits and Vegetable Products Sectional Committee had been approved by the Food and Agriculture Division Council.

Jams, jellies and marmalades are widely consumed. It is, however, necessary to ensure the quality of these products, if the demand is to be maintained and further developed. In order to ensure maintenance of proper quality, it is necessary to have strict quality control based on specifications. It was, therefore, found necessary to formulate an Indian Standard for these products.

This Indian Standard was first published in 1970. It has been revised to update its requirements, taking into consideration the CODEX STAN 79 Codex Standard for Jams (fruit preserves) and Jellies and the European Economic Community (EEC) Directive 79/693/EEC of 24 July 1979 on the approximation of the laws of the Member States relating to fruit jams, jellies and marmalades and chestnut puree. Wherever, it has not been possible to conform to the EEC requirements, additional requirements for EEC have been given in Annex E to ensure conformity for the purpose of trade to EEC countries.

In the preparation of this standard, due consideration has been given to the provisions of the *Prevention of Food Adulteration Act, 1954* and the Rules framed thereunder, and also the *Fruit Product Order, 1955*. However, this standard is subject to the restrictions imposed under these, wherever applicable.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

JAMS, JELLIES AND MARMALADES — SPECIFICATION

(First Revision)

1 SCOPE

1.1 This standard prescribes the requirements and methods of sampling and test for jams, jellies and marmalades.

2 REFERENCES

2.1 The Indian Standards listed in Annex A are necessary adjuncts to this standard.

3 TERMINOLOGY

3.0 For the purpose of this standard, the following definitions shall apply.

3.1 Jam

Product prepared from a suitable fruit ingredient of one or two or more types which may be:

a) whole fruit, pieces of fruit, fruit pulp or fruit puree;

b) with or without fruit juice or concentrated fruit juice as an optional ingredient;

c) mixed with a carbohydrate sweetener, with or without water; and

d) processed to a suitable consistency.

3.2 Jelly

Product prepared from a suitable fruit ingredient of one or two or more types of fruit which is:

a) practically free from suspended fruit particles;

b) mixed with a carbohydrate sweetener, with or without water; and

c) processed to a semi-solid consistency.

3.3 Marmalade

A mixture brought to a suitable gelled consistency of sugars and one or more of the following products obtained from citrus fruit:

Pulp, puree, juice, aqueous extracts and peel.

3.4 Jelly Marmalade

Product from which all the insoluble solids, or all insoluble solids except for a small proportion of thinly cut peel, have been removed during the process of manufacture.

3.5 Fruit

Fresh, frozen, canned, concentrated or otherwise processed or preserved fruit, free from deterioration containing all its essential constituents and sufficiently ripe for use in the removal of blemishes, topping and tailing, cores, pits and may or may not be peeled.

3.6 Fruit Pulp

The edible portions of the fruit, mashed or cut into pieces, but not reduced to a puree.

3.7 Fruit Puree

Fruit ingredient finely divided by sieving, screening or other mechanical means.

3.8 Fruit Juice

The juice obtained from fruit, fermentable but unfermented, having the characteristic colour, aroma and flavour typical of the juice from the fruit from which it comes.

3.9 Aqueous Extract of Fruit

The aqueous extract of fruit is which (subject to the losses necessarily occuring in proper manufacturing) contains all the water soluble constituents of the fruit used.

3.10 Soluble Solids

Percent by weight of soluble solids as determined by the refractrometric method corrected to 20°C using the International Sucrose Scale but making no correction for insoluble solids or seeds.

3.11 Harmless Extraneous Vegetable Material

Vegetable material common to the specific fruit such as leaves, full caps, stems of over 10 mm in length and sepal bracts aggregating an area of 5 mm^2 or larger.

3.12 Pit (Stone)

A whole pit or stone in fruits, such as cherries, that are normally pitted; or a piece of pit of approximately one-half pit.

3.13 Pit Fragments

Pieces of pit less than the equivalent of one-half pits, and which weighs at least 5 mg.

3.14 Damaged Fruit

A piece of fruit that is blemised, discoloured or bruised by pathological or other means to the extent that it is materially affected.

3.15 Weeping Jellies

Jellies that give out water after cooling due to synerisis.

3.16 Sugar *Crystallization*

Appearance of sugar crystals in jams, jellies and marmalades.

4 REQUIREMENTS

4.1 General Requirements

4.1.1 Jams and jellies shall be prepared from any fruit ingredient singly or in combination.

4.1.2 *Prepared Fruit Content*

The prepared fruit content in jams, jellies and marmalades shall be not less than 45 percent by mass, except in strawberry, raspberry and ginger jams when the minimum fruit content shall be not less than 25 percent by mass. The minimum fruit content for cashew apples shall be 23 percent and 8 percent for passion fruit. When two or more fruits are used in combination, the mass of each fruit shall be not less than 10 percent of the mass of the combined fruit ingredients.

4.1.3 *Ingredients*

The other substances that may be added to the products are cane sugar, sucrose, dextrose, invert sugar, liquid glucose, sodium, potassium or calcium salts of citric and tartaric acid.

4.1.4 *Pectin*

Pectin derived from any fruit but limited to 1 percent maximum may be used.

4.1.5 *Preservatives*

Sulphur dioxide or any other suitable sulphite may be used. The residual sulphur dioxide (SO_2) content shall not exceed 40 parts per million when tested according to the method prescribed in Appendix B of IS 4624 : 1968. Benzoic acid may also be used, limit shall not exceed 200 ppm when tested by the method prescribed in IS 12014 (Part 1) : 1986.

4.1.6 *Colour*

Permitted natural or coaltar colours may be used subject to a limit of 200 mg/kg.

4.1.7 *Flavouring Agents*

Permitted fruit flavours may be used.

4.1.8 *Acidifying Agents*

Citric acid, malic acid, *DL* lactic acid and *L.* tartaric acid may be used. *L.* tartaric acid if used, shall not exceed 600 ppm.

4.1.9 *Antioxidants*

Ascorbic acid may be used.

4.2 Requirements of End Products

4.2.1 *Jams*

The finished product shall have gelled consistency. It shall have colour and flavour of original fruit and shall be free from burnt or objectionable flavours, weeping, crystallization, mould growth and shall show no sign of fermentation.

4.2.2 *Jellies and Marmalades*

The finished product shall be reasonably uniform and shall be of good keeping quality and attractive colour. Fruit jellies shall be of gelatinous consistency. It shall be clear, sparkling, transparent, of an attractive colour, normal to the type of fruit. It shall not be syrupy, sticky or gummy and should retain the flavour or aroma of original fruit. The product shall be free from burnt or objectionable flavours, weeping, crystallization. Marmalades shall have a uniform suspension of peel.

4.2.3 *Defects*

The product shall be practically free from extraneous vegetable materials normally associated with the fruits such as peels, skin, pits, pit fragments, etc.

4.2.4 *Total Soluble Solids*

The total soluble solids content, when tested according to the method prescribed in Annex B, in the case of jams shall be not less than 68 percent by mass and not less than 65 percent by mass in case of jellies and marmalades.

4.2.5 *Minimum Fill*

Containers shall be filled as commercially practicable. However, the product shall occupy not less than 90 percent of the water capacity of the container when tested in accordance with the method prescribed in Annex C. The water capacity of the container is the volume of distilled water at 27°C which the sealed container will hold when completely filled.

4.2.5.1 When product is packed in glass containers, the water capacity shall be reduced by 20 ml.

4.2.6 Jams, jellies and marmalades shall not contain any metallic contaminants in excess of the quantities specified in Table 1.

4.2.7 *Microbiological Requirements*

When tested by the method prescribed in **18** of IS 2860: 1964 the product shall be : (a) free from micro organisms capable of development under normal conditions of storage, (b) shall not contain substances originating from microorganisms which may represent a hazard to health.

4.2.8 *Freedom from Moulds*

The product shall not contain any mould filaments when tested in accordance with the method prescribed in Annex D.

Table 1 Limits for Metallic Contaminants in Jams, Jellies and Marmalades

(*Clause* 4.2.6)

Sl No.	Characteristic	Requirement	Method of Test, Ref to Cl No. of IS 2860 : 1964
(1)	(2)	(3)	(4)
i)	Arsenic (as As),	1.0	13
ii)	Lead (as Pb), ppm, *Max*	2.5	14
iii)	Copper (as Cu), ppm, *Max*	30	15
iv)	Zinc (as Zn), ppm, *Max*	19	16
v)	Tin (as Sn), ppm, *Max*	100	17

5 PACKING AND MARKING

5.1 Packing

The product shall be packed either in glass bottles or in hermetically sealed, open top sanitary cans made from tinplates which are inside lacquered or in food grade plastic containers or asceptic packages.

5.2 Marking

Each pack shall be marked or labelled with the following particulars:

a) Name of the product with the brand name, if any;
b) Indication of the source of manufacture;
c) Net content in grams;
d) Month and year of manufacture;
e) Batch or code number, if any;
f) List of ingredients in descending order;
g) List of additives, if used;
h) The words 'Best before.........(month and year to be indicated)';
j) Manufacturing licence number; and
k) Any other details required under the *Standards of Weights and Measures (Packaged Commodities) Rules and Prevention of Food Adulteration Rules, 1955.*

6 SAMPLING

6.1 The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in IS 2860 : 1964.

7 TESTS

7.1 Tests shall be carried out as prescribed in **4.1.5, 4.2.4, 4.2.7, 4.2.8** and col 4 of Table 1.

ANNEX A

(*Clause* 2.1)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
2860 : 1964	Methods of sampling and test for processed fruits and vegetables
4624 : 1984	Specification for dehydrated peas *(first revision)*
12014 (Part 1) : 1986	Determination of organic preservatives in foodstuffs : Part 1 Benzoic acid and its salts

ANNEX B

(*Clause* 4.2.4)

DETERMINATION OF TOTAL SOLUBLE SOLIDS

B-1 APPARATUS

B-1-1 Refractometer

Equipped with a sugar scale. The temperature of the refractometer should be controlled to within ±0.1°C, and for this purpose, it should be provided with a thermostatically controlled water bath and a motor driven pump to circulate water through the instrument. The instrument should be standardized by following the manufacturer's instructions.

B-1.2 Light Source

If the refractometer is equipped with a compensator, a tungsten lamp or a daylight bulb may used. Otherwise, a monochromatic light, such as electric sodium vapour lamp, should be used.

B-2 PROCEDURE

B-2.1 Take representative samples of a well-mixed portion of jam or jelly free from seed and fibre, place on refractometer prisms and read directly at 20°C. If temperature correction is necessary, use the correction factor given in Table 2. It is preferable to have the instrument maintained at constant temperature by circulating water through the prisms. For very accurate results a correction should be made for water insoluble solids as follows:

Percent soluble solids

$$= \text{Percent solids by refractometer} \times \frac{(100 \times a)}{100}$$

where

a = percent water-insoluble solids.

Table 2 Temperature Corrections for the Standard Model of Sugar Refractometer Calibrated for 20°C

(*Clause* B-2.1)

Temperature, °C	Percentage of Dry Substance													
	5	10	15	20	25	30	35	40	45	50	55	60	65	70
15	0.29	0.31	0.33	0.34	0.34	0.35	0.36	0.37	0.37	0.38	0.39	0.39	0.40	0.40
16	0.24	0.25	0.26	0.27	0.28	0.28	0.29	0.30	0.30	0.30	0.31	0.31	0.32	0.32
17	0.18	0.19	0.20	0.21	0.21	0.21	0.22	0.22	0.23	0.23	0.23	0.23	0.24	0.24
18	0.13	0.13	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.16
19	0.06	0.06	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
21	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22	0.13	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16
23	0.20	0.21	0.22	0.22	0.23	0.23	0.23	0.23	0.24	0.24	0.24	0.24	0.24	0.24
24	0.27	0.28	0.29	0.30	0.30	0.31	0.31	0.31	0.31	0.31	0.32	0.32	0.32	0.32
25	0.35	0.36	0.37	0.38	0.38	0.39	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
26	0.42	0.43	0.44	0.45	0.46	0.47	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
27	0.50	0.52	0.53	0.54	0.55	0.55	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
28	0.57	0.60	0.61	0.63	0.63	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
29	0.66	0.68	0.69	0.71	0.72	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
30	0.74	0.77	0.78	0.79	0.80	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81

*Up to 19°C subtract from dry substance above 20°C. Add to dry substance.

ANNEX C

(*Clause* 4.2.5)

DETERMINATION OF WATER CAPACITY

C-1 GENERAL

This method applies to metal containers and glass containers.

C-2 PROCEDURE

C-2.1 Metal Containers

C-2.1.1 Select a container which is undamaged in all respects.

C-2.1.2 Wash, dry and weigh the empty container after cutting out the lid without removing or altering the height of the double seam.

C-2.1.3 Fill the container with distilled water at 27°C to 4.8 mm vertical distance below the top level of the container, and weigh the container thus filled.

C-2.2 Glass Containers

C-2.2.1 Select a container which is undamaged in all respects.

C-2.2.2 Wash, dry and weigh the empty container.

C-2.2.3 Fill the container with distilled water at 27°C to the level of the top thereof, and weigh the container thus filled.

C-3 CALCULATION AND EXPRESSION OF RESULTS

C-3.1 Metal Containers

Subtract the mass found in C-**2.1.2** from the mass found in C- **2.1.3**. The difference shall be considered to be the mass of water required to fill the container. Results are expressed as ml of water, percent.

C-3.2 Glass Containers

Subtract the mass found in C-**2.2.2** from the mass found in C- **2.2.3**. The difference shall be considered to be the mass of water required to fill the container. Results are expressed as ml of water, percent.

ANNEX D

(*Clause* 4.2.8)

ESTIMATION OF MOULD COUNT

D-1 APPARATUS

D-1.1 Howard Mould-Counting Apparatus

D-1.1.1 *Howard Mould-Counting Slide*

Glass slide of one-piece construction with flat plane circle, about 19 mm in diameter or rectangle 20 mm x 15 mm, surrounded by moat and flanked on each side by shoulders 0.1 mm higher than plane surface. Cover glass is supported on shoulders and leaves depth of 0.1 mm between underside of cover glass and plane surface. Central plane, shoulders and cover glass have optically worked surfaces. To facilitate calibration of microscope, new slides are engraved with circle 1.382 mm in diameter or with 2 fine parallel lines 1.382 mm apart.

D-1.1.2 *Accessory Disc for Mould-Counting*

Glass disc fitting into microscope eyepiece, ruled into squares each side of which is equal to one sixth of the diameter of field. Since limiting diaphragm is eyepiece field stop, rulings, equal one sixth of this diaphragm opening. Field viewed on slide with mould/counting microscope has diameter of 1.382 mm of magnification of 90 to 125 X.

D-1.2 Compound Microscope

With standardized field of view of 1.382 mm diameter at 90 to 125 X; and equipped with drop-in ocular disc ruled in squares, each of which is one-sixth of field diameter.

D-2 PROCEDURE

D-2.1 Clean Howard cell so that Newton's rings are produced between slide and cover glass. Remove cover and with knife blade or scalpel, place portion of well-mixed sample upon central disc; with same instrument; spread it evenly and cover with glass so as to give uniform distribution. Use enough sample to bring material to edge of dish. (It is of utmost importance that portion be taken from thoroughly-mixed sample and spread evenly over slide disc. Otherwise , when cover slip is put in place, insoluble material, and consequently moulds may be more abundant at centre of mount). Discard any mount showing uneven distribution or absence of Newton's rings, or liquid that has been drawn across most and between cover glass and shoulder.

D-2.2 Place slide under microsope and examine with such adjustment that each field of view covers 1.5 mm^2 .(This area, which is essential, may frequently be obtained by so adjusting draw-tube that diameter of field becomes 1.382 mm). When such adjustment is not possible , make accessory drop-in ocular diaphragm with aperture accurately cut to necessary size. Diameter of area field of view can be determined by use of stage micrometer. When instrument is properly adjusted, quantity of liquid examined per field is 0.15 mm^3. Use magnification of 90 to 125 X. In those instances where indentifying characteristics of mould filaments are not clearly discernible in standard field, use magnification of approximately 200 X (8 mm objective) to confirm identity of mould filaments previously observed in standard field.

D-2.3 From each of 2 or more mounts examine at least 25 fields taken in such a manner as to be representative of all sections of mount. Observe each field, noting presence or absence of mould filaments and recording results saw positive when aggregate length of not more than 3 filaments present exceeds one-sixth of diameter of field.

D-3 CALCULATIONS

D-3.1 Calculate portion of positive fields from results of examination of all observed fields and report as percent fields containing mould filaments.

ANNEX E

(*Clauses* 4.1.1, 4.1.2, 4.1.5 *and* 4.1.6)

ADDITIONAL REQUIREMENTS FOR EEC

E-0 For export to EEC countries, the following additional requirements have to be complied with.

E-1 Jams and jellies containing two or more fruits shall exclude apples, pears, clingstones, plums, melons, water melons, grapes, pumpkings and tomatoes.

E-2 Edible part of rhubarb stalks and edible root of ginger plant preserved in syrup after being drained and peeled are considered as fruit.

E-3 The minimum fruit content shall be not less than 35 percent for jams and jellies prepared from black currants, rosehips and quines.

E-4 Sulphites are permissible as preservatives provided the soluble solid content is not more than 65 percent (*see* **4.2.4**). However, residual sulphur dioxide content shall not exceed 10 mg/kg when tested in accordance with Appendix B of IS 4624 : 1968.

E-5 Colouring matter may be added only where the products are manufactured from any one or more of the following : strawberries, raspberries, gooseberries, red currants, and plums.

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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Amendments are issued to standards as the need arises on the basis of comments. Standards are any reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards Monthly Additions'. Comments on this Indian Standard may be sent to BIS giving the following reference:

Doc : No. FAD 10 (215)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Printed at New India Printing Press, Khurja, India